

## Search Plan and Results

### Question

[How do the health outcomes of a vegetarian diet compare to that of a diet which customarily includes animal products? \(DGAC 2010\)](#)

### Date Searched

6/4/09

### Inclusion Criteria

- January 2000 to June 2009
- Human subjects
- English language
- International
- *Sample size*: Minimum of 10 subjects per study arm; preference for larger sizes, if available
- *Dropout rate*: Less than 20%; preference for smaller dropout rates
- *Ages*: Children two to 18 years; Adults: 19 and older
- *Populations*: Healthy, those with elevated chronic disease risk.

### Exclusion Criteria

- Medical treatment/therapy
- Diseased subjects (already diagnosed with CHD/CVD, hypertension, type 2 diabetes, osteoporosis, and/or osteopenia)
- Hospitalized patients
- Animal studies
- In vitro studies
- Articles not peer reviewed (websites, magazine articles, Federal reports, etc.).

### Search Terms: Search Vocabulary

("Vegetable Proteins"[Mesh] OR "Diet, Vegetarian"[Mesh] OR ("plant based" AND (diet OR diets OR food[mesh])))

AND

(Animal protein\* OR "animal based" OR dairy OR meat[mesh] OR "Egg Proteins, Dietary"[Mesh] OR "Milk Proteins"[Mesh] OR "Fish Proteins"[Mesh])

### Electronic Databases

**Total hits from all electronic database searches: 230**

**Total articles identified to review from electronic databases: 29**

Articles Identified Via Handsearch or Other Means

**Hand search (five articles):**

Alewaeters K, Clarys P, Hebbelinck M, Deriemaeker P, Clarys JP. [Cross-sectional analysis of BMI and some lifestyle variables in Flemish vegetarians compared with non-vegetarians.](#) *Ergonomics*. 2005 Sep 15-Nov 15; 48 (11-14): 1, 433-1, 444. PMID: 16338711. (Hand search)

Appleby PN, Davey GK, Key TJ. [Hypertension and blood pressure among meat eaters, fish eaters, vegetarians and vegans in EPIC-Oxford.](#) *Public Health Nutr*. 2002 Oct; 5 (5): 645-654. PMID: 12372158. (Hand search)

Hung CJ, Huang PC, Li YH, Lu SC, Ho LT, Chou HF. [Taiwanese vegetarians have higher insulin sensitivity than omnivores.](#) *Br J Nutr*. 2006 Jan; 95 (1): 129-135. PMID: 16441925 (Hand search)

Key TJ, Appleby PN, Spencer EA, Travis RC, Roddam AW, Allen NE. [Mortality in British vegetarians: Results from the European Prospective Investigation into Cancer and Nutrition \(EPIC-Oxford\).](#) *Am J Clin Nutr*. 2009 May; 89 (5): 1, 613S-1, 619S. Epub 2009 Mar 18. PMID: 19297458. (Hand search)

Spencer EA, Appleby PN, Davey GK, Key TJ. [Diet and body mass index in 38000 EPIC-Oxford meat-eaters, fish-eaters, vegetarians and vegans.](#) *Int J Obes Relat Metab Disord*. 2003 Jun; 27 (6): 728-734. PMID: 12833118. (Hand search)

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Summary of Articles Identified to Review

**Number of Primary Articles Identified: 18**

**Number of Review Articles Identified: 0**

**Total Number of Articles Identified: 18**

**Number of Articles Reviewed but Excluded: 16**

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List of Articles Included for Evidence Analysis

## Primary Research Citations

- Alewaeters K, Clarys P, Hebbelinc M, Deriemaeker P, Clarys JP. [Cross-sectional analysis of BMI and some lifestyle variables in Flemish vegetarians compared with non-vegetarians](#). *Ergonomics*. 2005 Sep 15-Nov 15; 48 (11-14): 1, 433-1, 444. PMID: 16338711. (Hand search)
- Appleby PN, Davey GK, Key TJ. [Hypertension and blood pressure among meat eaters, fish eaters, vegetarians and vegans in EPIC-Oxford](#). *Public Health Nutr*. 2002 Oct; 5 (5): 645-654. PMID: 12372158. (Hand search)
- Appleby P, Roddam A, Allen N, Key T. [Comparative fracture risk in vegetarians and non-vegetarians in EPIC-Oxford](#). *Eur J Clin Nutr*. 2007 Dec; 61 (12): 1, 400-1, 406. Epub 2007 Feb 7. PMID: 17299475.
- Baines S, Powers J, Brown WJ. [How does the health and well-being of young Australian vegetarian and semi-vegetarian women compare with non-vegetarians?](#) *Public Health Nutr*. 2007 May; 10 (5): 436-442. PMID: 17411462.
- Chen CW, Lin YL, Lin TK, Lin CT, Chen BC, Lin CL. [Total cardiovascular risk profile of Taiwanese vegetarians](#). *Eur J Clin Nutr*. 2008 Jan; 62 (1): 138-144. Epub 2007 Mar 14. PMID: 17356561.
- Dos Santos Silva I, Mangtani P, McCormack V, Bhakta D, Sevak L, McMichael AJ. [Lifelong vegetarianism and risk of breast cancer: A population-based case-control study among South Asian migrant women living in England](#). *Int J Cancer*. 2002 May 10; 99 (2): 238-244. PMID: 11979439.
- Grant R, Bilgin A, Zeuschner C, Guy T, Pearce R, Hokin B, Ashton J. [The relative impact of a vegetable-rich diet on key markers of health in a cohort of Australian adolescents](#). *Asia Pac J Clin Nutr*. 2008; 17 (1): 107-115. PMID: 18364335.
- Hung CJ, Huang PC, Li YH, Lu SC, Ho LT, Chou HF. [Taiwanese vegetarians have higher insulin sensitivity than omnivores](#). *Br J Nutr*. 2006 Jan; 95 (1): 129-135. PMID: 16441925 [PubMed - indexed for MEDLINE] (Hand search)
- Key TJ, Appleby PN, Spencer EA, Travis RC, Roddam AW, Allen NE. [Cancer incidence in vegetarians: Results from the European Prospective Investigation into Cancer and Nutrition \(EPIC-Oxford\)](#). *Am J Clin Nutr*. 2009 May; 89 (5): 1, 620S-1, 626S. Epub 2009 Mar 11. PMID: 19279082.
- Key TJ, Appleby PN, Spencer EA, Travis RC, Roddam AW, Allen NE. [Mortality in British vegetarians: Results from the European Prospective Investigation into Cancer and Nutrition \(EPIC-Oxford\)](#). *Am J Clin Nutr*. 2009 May; 89 (5): 1, 613S-1, 619S. Epub 2009 Mar 18. PMID: 19297458. (Hand search)
- Newby PK, Tucker KL, Wolk A. [Risk of overweight and obesity among semi vegetarian, lactovegetarian and vegan women](#). *Am J Clin Nutr*. 2005 Jun; 81 (6): 1, 267-1, 274. PMID: 15941875.
- Nakamoto K, Watanabe S, Kudo H, Tanaka A. [Nutritional characteristics of middle-aged Japanese vegetarians](#). *J Atheroscler Thromb*. 2008 Jun; 15 (3): 122-129. PMID: 18603818.
- Rosell M, Appleby P, Spencer E, Key T. [Weight gain over five years in 21,966 meat-eating, fish-eating, vegetarian and vegan men and women in EPIC-Oxford](#). *Int J Obes (Lond)*. 2006 Sep; 30 (9): 1, 389-1, 396. Epub 2006 Mar 14. PMID: 16534521.
- Spencer EA, Appleby PN, Davey GK, Key TJ. [Diet and body mass index in 38000 EPIC-Oxford meat-eaters, fish-eaters, vegetarians and vegans](#). *Int J Obes Relat Metab Disord*. 2003 Jun; 27 (6): 728-734. PMID: 12833118. (Hand search)
- Teixeira Rde C, Molina Mdel C, Zandonade E, Mill JG. [Cardiovascular risk in vegetarians and omnivores: A comparative study](#). *Arq Bras Cardiol*. 2007 Oct; 89 (4): 237-244. English, Portuguese. PMID: 17992380.
- Thorpe DL, Knutsen SF, Beeson WL, Rajaram S, Fraser GE. [Effects of meat consumption and vegetarian diet on risk of wrist fracture over 25 years in a cohort of peri- and postmenopausal women](#). *Public Health Nutr*. 2008 Jun; 11 (6): 564-572. Epub 2007 Aug 9. PMID: 17686206.
- Wang YF, Chiu JS, Chuang MH, Chiu JE, Lin CL. [Bone mineral density of vegetarian and non-vegetarian adults in Taiwan](#). *Asia Pac J Clin Nutr*. 2008; 17 (1): 101-106. PMID: 18364334.
- Yen CE, Yen CH, Huang MC, Cheng CH, Huang YC. [Dietary intake and nutritional status of vegetarian and omnivorous preschool children and their parents in Taiwan](#). *Nutr Res*. 2008 Jul; 28 (7): 430-436. PMID: 19083442.

List of Excluded Articles with Reason

Article	Reason for Exclusion
<p>Allen NE, Appleby PN, Davey GK, Kaaks R, Rinaldi S, Key TJ. <a href="#">The associations of diet with serum insulin-like growth factor I and its main binding proteins in 292 women meat-eaters, vegetarians and vegans.</a> <i>Cancer Epidemiol Biomarkers Prev.</i> 2002 Nov; 11 (11): 1, 441-1, 448. PMID: 12433724.</p>	<p>Does not include body weight or incidence of disease in analyses.</p>
<p>Barr SI, Chapman GE. <a href="#">Perceptions and practices of self-defined current vegetarian, former vegetarian and non-vegetarian women.</a> <i>J Am Diet Assoc.</i> 2002 Mar; 102 (3): 354-360. PMID: 11902368.</p>	<p>Does not include body weight or incidence of disease in analyses.</p>
<p>Bernstein AM, Treyzon L, Li Z. <a href="#">Are high-protein, vegetable-based diets safe for kidney function? A review of the literature.</a> <i>J Am Diet Assoc.</i> 2007 Apr; 107 (4): 644-650. Review. PMID: 17383270.</p>	<p>Study design is narrative review.</p>
<p>Greene-Finestone LS, Campbell MK, Evers SE, Gutmanis IA. <a href="#">Attitudes and health behaviors of young adolescent omnivores and vegetarians: A school-based study.</a> <i>Appetite.</i> 2008 Jul; 51 (1): 104-110. Epub 2007 Dec 28. PMID: 18249472.</p>	<p>Does not include body weight or incidence of disease in analyses.</p>
<p>Hossain MI, Islam MM, Wahed MA, Khatun M, Kabir I. <a href="#">Lentil-based high protein diet is comparable to animal-based diet in respect to nitrogen absorption and nitrogen balance in malnourished children recovering from shigellosis.</a> <i>Asia Pac J Clin Nutr.</i> 2009; 18 (1): 8-14. PMID: 19329389.</p>	<p>Participants recovering from shigellosis (nutritional rehabilitation).</p>
<p>Jeejeebhoy KN. <a href="#">Vegetable proteins: Are they nutritionally equivalent to animal protein.</a> <i>Eur J Gastroenterol Hepatol.</i> 2000 Jan; 12 (1): 1-2. PMID: 10656201.</p>	<p>Does not include body weight or incidence of disease in analyses.</p>
<p>Jenkins DJ, Kendall CW, Faulkner DA, Kemp T, Marchie A, Nguyen TH, Wong JM, de Souza R, Emam A, Vidgen E, Trautwein EA, Lapsley KG, Josse RG, Leiter LA, Singer W. <a href="#">Long-term effects of a plant-based dietary portfolio of cholesterol-lowering foods on blood pressure.</a> <i>Eur J Clin Nutr.</i> 2008 Jun; 62 (6): 781-788. Epub 2007 Apr 25. PMID: 17457340.</p>	<p>Does not include comparison of vegetarian and non-vegetarian dietary patterns in analyses.</p>
<p>Key TJ, Appleby PN, Rosell MS. <a href="#">Health effects of vegetarian and vegan diets.</a> <i>Proc Nutr Soc.</i> 2006 Feb; 65 (1): 35-41. Review. PMID: 16441942.</p>	<p>Study design is narrative review.</p>

<p>Kohlenberg-Mueller K, Raschka L. <a href="#">Calcium balance in young adults on a vegan and lactovegetarian diet.</a> <i>J Bone Miner Metab.</i> 2003; 21 (1): 28-33. PMID: 12491091.</p>	<p>Sample size less than inclusion criteria.</p>
<p>Krajcovicova-Kudlackova M, Babinska K, Valachovicova M. <a href="#">Health benefits and risks of plant proteins.</a> <i>Bratisl Lek Listy.</i> 2005; 106 (6-7): 231-234. Review. PMID: 16201743.</p>	<p>Study design is narrative review.</p>
<p>Lanou AJ. <a href="#">Should dairy be recommended as part of a healthy vegetarian diet? Counterpoint.</a> <i>Am J Clin Nutr.</i> 2009 May; 89 (5): 1, 638S-1, 642S. Epub 2009 Mar 25. PMID: 19321571.</p>	<p>Study design is narrative review.</p>
<p>Merrill RM, Aldana SG. <a href="#">Consequences of a plant-based diet with low dairy consumption on intake of bone-relevant nutrients.</a> <i>J Womens Health (Larchmt).</i> 2009 May; 18 (5): 691-698. PMID: 19368508.</p>	<p>Does not include comparison of vegetarian and non-vegetarian dietary patterns in analyses.</p>
<p>Perry CL, McGuire MT, Neumark-Sztainer D, Story M. <a href="#">Adolescent vegetarians: How well do their dietary patterns meet the healthy people 2010 objectives?</a> <i>Arch Pediatr Adolesc Med.</i> 2002 May; 156 (5): 431-437. PMID: 11980547.</p>	<p>Does not include body weight or incidence of disease in analyses.</p>
<p>Walkowiak J, Wadolowska L, Szaflarska-Poplawska A, Lisowska A, Bugajewska A, Przyslawski J. <a href="#">The elimination of meat from the diet selectively decreases pancreatic elastase secretion.</a> <i>Br J Nutr.</i> 2007 Jul; 98 (1): 154-158. Epub 2007 Mar 19. PMID: 17367570.</p>	<p>Does not include comparison of vegetarian and non-vegetarian dietary patterns in analyses.</p>
<p>Weaver CM. <a href="#">Should dairy be recommended as part of a healthy vegetarian diet? Point.</a> <i>Am J Clin Nutr.</i> 2009 May; 89 (5): 1, 634S-1, 637S. Epub 2009 Mar 25. Review. PMID: 19321565.</p>	<p>Study design is narrative review.</p>
<p>Wells AM, Haub MD, Fluckey J, Williams DK, Chernoff R, Campbell WW. <a href="#">Comparisons of vegetarian and beef-containing diets on hematological indexes and iron stores during a period of resistive training in older men.</a> <i>J Am Diet Assoc.</i> 2003 May; 103 (5): 594-601. PMID: 12728219; PMCID: PMC2495081.</p>	<p>Does not include body weight or incidence of disease in analyses.</p>